

Amendments to the Drawings:

Replacement sheets for drawing sheet number 4, including figs. 5 and 6, and drawing sheet number 5, including fig. 7, are attached with this reply. These replace the original sheets that include figs. 5, 6, and 7. The shading areas of the original drawing sheets have been removed in the attached replacement sheets.

Attachments following last page of this Amendment:

Replacement Sheets (2 pages).

### REMARKS

Claims 1-13 are pending in the application with claim 1 being independent. Applicants respectfully request reconsideration in view of the following remarks.

#### Title

As required by the Office, the title has been amended.

#### Drawings

The Office objected to the drawings, because some of the drawings included black shading areas. Replacement sheets for drawing sheet number 4, including figs. 5 and 6, and drawing sheet number 5, including fig. 7, have been submitted with this reply. These amendments to the drawing sheets remove the shading areas. Withdrawal of the corresponding objections to the drawings is respectfully requested.

#### Allowable Subject Matter

The indication of allowable subject matter in claims 3, 4, 6-8, and 12 is acknowledged and appreciated. Applicants reserve the right to rewrite these claims in independent form at a later date.

#### 35 U.S.C. § 102 Rejection:

Claims 1, 2, 9, and 10 stand rejected under 35 U.S.C. 102(b) as being allegedly anticipated by Schmidt '897 (US Publication No. 20030117897). Claims 1, 2, 9, and 10 stand rejected under 35 U.S.C. 102(b) as being allegedly anticipated by Schmidt '685 (US Publication No. 20020080685). Note that Schmidt '897 is a continuing application of Schmidt '685. Claims 1, 2, 5, 9, and 13 stand rejected under 35 U.S.C. 102(b) as being allegedly anticipated by Breton (US Patent No. 4939700). These rejections are respectfully traversed.

Independent claim 1 recites (underlining added for emphasis) "A sonar antenna comprising an axially symmetric acoustic surface having the cross-sectional form of a generally

U-shaped curve of non constant curvature; wherein the curve is shaped to allow continuous coherent ensonification such that the power in the echo returned from a uniform flat sea floor is substantially constant." Neither Schmidt nor Breton teaches the subject matter of independent claim 1.

#### Rejections under Schmidt

In regard to Schmidt, the Office asserts "the reference discloses the utilization of spaced apart sonar transducers arranged on a paraboloid surface of a torpedo (see Figure 1 and paragraphs 0002 and 0001) as recited in the aforementioned claims." In the Office's cited portions, Schmidt discloses that the transducers are arranged in several zones along a hemispherical or paraboloid-shaped torpedo bow. However, Schmidt completely fails to disclose a curve shaped to allow continuous coherent ensonification such that the power in the echo returned from a uniform flat sea floor is substantially constant, as recited in claim 1.

The Office failed to consider claim 1 as a whole. Under 35 U.S.C. 102, a reference must disclose all limitations of the claimed subject matter. In particular, "The identical invention must be shown in as complete detail as is contained in the ...claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Schmidt does not teach that the transducers form a shape which allows continuous coherent ensonification, in accordance with claim 1 as currently claimed, such that the power in the echo returned from a uniform flat sea floor is substantially constant. For at least these reasons, independent claim 1 is patentable over both Schmidt references.

Dependent claims 2, 9, and 10 depend from independent claim 1. For at least the reason of their dependency on an independent claim that is patentable over both Schmidt references, dependent claims 2, 9, and 10 are also patentable over both Schmidt references.

#### Rejections under Breton

The Office asserts Fig. 3 of Breton against claim 1. Breton teaches:

FIG. 3 shows an array of receiving elements  $x_1, x_2, x_3 \dots x_n$ , which are fastened to the hull 10 of ship 2. Known signal processing is used for treating the signals from each element or transducer  $x_1$  through  $x_n$  so that in effect the signals are projected onto a common reference plane or line. This avoids any inaccuracies of the contour estimates which would be introduced by the fact that the transducers lie on a curved path along the bottom of the hull 10.

See Breton at col. 5, lines 37-45. At the cited portion, Breton discloses that transducers lie on a curved path along the bottom of the hull. Breton's arrangement of transducers on the hull of a ship creates fanned beams transverse to the ship. In such an arrangement the intensity of the echo falls rapidly with distance and can therefore be compensated by changing the gain of the receiving transducers in a predetermined manner. This is exemplified by Lustig's U.S. Patent No. 3,144,631.

In regard to Lustig's patent, Breton teaches "Details on how signals from the transmitter and receiver are processed for shading (multiplying or amplification) and steering (to selected known angles) can be found in the above-identified Lustig et al patents. U.S. Pat. No. 3,144,631 to Lustig et al is incorporated here by reference" (col. 5, lines 31-36). Because of Breton's incorporation of Lustig's patent and Breton's disclosure regarding the use of Lustig, one of ordinary skill in the art would use Lustig's techniques to practice Breton.

The teachings of Lustig, incorporated by reference into Breton and used within Breton, run contrary to the currently claimed subject matter, e.g., the curve is shaped to allow continuous coherent ensonification such that the power in the echo returned from a uniform flat sea floor is substantially constant. Thus, it is not surprising that both Breton and Lustig completely fail to disclose a curve shaped to allow continuous coherent ensonification such that the power in the echo returned from a uniform flat sea floor is substantially constant. For at least these reasons, independent claim 1 is patentable over Breton.

Dependent claims 2, 5, 9, and 13 depend from independent claim 1. For at least the reason of their dependency on a claim that is patentable over Breton, dependent claims 2, 5, 9, and 13 are also patentable over Breton.

#### Claim 11

The Office Action Summary indicates that dependent claim 11 stands rejected. The Office has not produced any articulated reasons for rejecting claim 11 in the Office Action. The MPEP clearly states “The goal of examination is to clearly articulate any rejection early in the prosecution process so that the applicant has the opportunity to provide evidence of patentability and otherwise reply completely at the earliest opportunity” (See MPEP at 706).

Nonetheless, dependent claim 11 is patentable for at least the reason of its dependency on a patentable independent claim 1.

Applicants respectfully request the Office to allow all claims or provide such articulated reason in a subsequent non-final office action.

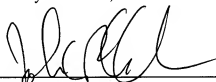
Concluding Comments

The foregoing comments made with respect to the positions taken by the Examiner are not to be construed as acquiescence with other positions of the Examiner that have not been explicitly contested. Accordingly, the above arguments for patentability of a claim should not be construed as implying that there are not other valid reasons for patentability of that claim or other claims.

In view of the above remarks, claims 1-13 are in condition for allowance, and a formal notice of allowance is respectfully requested.

Please apply the two-month extension of time fee of \$230 and any other charges or credits to deposit account 06-1050.

Respectfully submitted,



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